HYDROBIOLOGICAL STATUS OF ZARI DAM, TQ. PATHRI, DISTRICT PARBHANI (MS) INDIA

A
Synopsis
Submitted to

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स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड.

For the registration of

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In

ZOOLOGY

(Faculty of Science)

By

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PH.D. SYNOPSIS / WORK PLAN
ABSTRACT OF PROPOSED WORK PLAN/ PROBLEM:

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ABSTRACT OF PROPOSED WORK PLAN/ PROBLEM

1. Introduction:

Life is dependent on water. Water is one of the most crucial elements for all living things to survive (Trivedi *et al.* 2010). Freshwater bodies are specialized ecosystems with major ecological, economical, and cultural functions. One of the most essential functions of freshwater bodies is to offer sufficient habitat for aquatic creatures. The aquatic ecosystem is vital to humans because it provides drinking water, irrigation, fisheries, transportation, and recreation, among other things. It is also one of the most important sources of organic productivity.

Water bodies' physical and chemical features are being influenced to the greatest extent possible by the current era's rapid industrial growth and expanding population. Physical elements like light and heat have a big impact since they induce things like chemical stratification, seasonal qualitative and quantitative variations in plankton, micro, and macro-organisms, and water quality. There is a need for joint development and management of lakes, river basins, reservoirs, and wetlands, not only to maximize the benefits of this system but also to conserve the ecosystem that they define (James, 2005).

Hydrobiology is the science of life and life processes in water. Hydrobiology can be viewed as a sub-discipline of ecology but the sphere of hydrobiology includes taxonomy, economic and industrial biology, morphology, and physiology. The one distinguishing aspect is that all fields relate to aquatic organisms. Almost every component of an ecosystem's health is closely tied to the health of its biological reservoir. It is critical to understand the abiotic and biotic factors that influence the biological productivity of a freshwater body to successfully utilize it for fish production. The presence of free carbon dioxide, chlorinity, water hardness, key nutrients, their

effects, and biological variables will all be considered. The study of micro and macro flora and fauna will always give a clear picture of the ecological interaction that exists in a water body. The Minor Irrigation Dam namely Zari Dam, Zari village of Pathari Taluka of Parbhani District of Maharashtra are constructed used for irrigation, domestic, and aquaculture purpose. Still today, Hydrobiological studies of these water bodies are not carried out, so the present topic is selected for investigation.

2. Review of Literature:

A valuable amount of work has been carried out on hydrobiology, limnology, physicochemical parameters of water, water pollution, and algal distribution by many workers from India and abroad. Amongst these, some work has been reviewed in the present investigation as well.

R. V. Bhagde *et al.,* (2020) had studied a comparative study of physicochemical parameters of the freshwater ponds from Sangamner taluka of Ahmednagar, Maharashtra, India. S. D. Jadhav and M. S. Jadhav (2020) had studied seasonal variation in physicochemical parameters of Krishna river water of Satara district, Maharashtra, India. Jaffer Ali *et al.,* (2019) had investigates hydrobiological studies of Vandiyur lake, Madurai, Tamil Nadu, India. K. B. Arangale *et al.,* (2018) had investigates physicochemical parameters evaluation of dam water in different sites of Ahmednagar district of Maharashtra. Vethanayagam *et al,.* (2017) during the rainy season studied the water quality of giant tank situated in Mannar, Sri Lanka and predicted its domestic utility. Elmaci *et al.,* (2008) evaluated the physicochemical and microbiological properties of lake Uruabat, Turkey, known for its scenic beauty and richness of aquatic life. Adedeji *et al.,* (2019) studied different physicochemical analysis of lake Ribadu, Adamawa (Nigeria). Ashok Kumar Verma (2016) investigates Hydrobiological Studies of Muntjibpur Pond of Allahabad (U.P.) show different seasonal fluctuation in various Hydrobiological parameters. Shrirame *et al.,* (2014) have carried out statistical examination of water quality of Ghagardara pond in Nanded. Chandra *et al.,* (2014) had done hydrobiological survey of river Burhi Ganga in U.P. Kini *et al.,* (2016) reported seasonal variations of some physicochemical parameters of Bolinj Ram Mandir Talao, Virar, Palghar, Maharashtra, India. They studied the seasonal variations of various important

physicochemical parameters and observed that water is fairly contaminated. Rafiullah M. Khan *et al,.* (2012) had studied physicochemical analysis of Triveni lake water of Amravati district in Maharashtra, India. Kshirsagar and Gunale (2011) asses change in algal diversity (Palmer index) can be used to compare and classify water quality of river Mula from Pune. Ingole *et al.,* (2011) studied the water quality of Majalgaon Dam with special reference to zooplanktons. Resmi *et al.,* (2011) studied the zooplankton dynamics in the coastal waters Adubidri, Karnataka. Manjare *et al.,* (2010) investigates water quality using physicochemical parameters of Tamdalge tank in Kolhapur district and reported that tank was non-polluted.

3. Objectives of the Research Proposal:

1. To determine the physicochemical properties of fresh water at regular monthly intervals.
2. To study quantitative and qualitative analysis of plankton.
3. To study the taxonomic status of planktons and fishes.
4. To hint out the status of pollutants if any of the Zari dam.

4. Hypothesis:

The proposed work will add to the knowledge of the physical and chemical parameters of water for the selected study site. From this study, we can get knowledge of the freshwater fauna of the Zari dam. This study will provide the baseline for the ecology of the selected area.

5. Methodology:

The hydrological studies of the water, the physicochemical and biological parameter are involved. For the study of physicochemical parameter water samples from selected sampling stations will be collected monthly in 5 liter plastic container for determining the physical-chemical characteristics.

Physical parameters:-

1) Temperature will be measured by using Centigrade thermometer.
2) Transperancy by Secchi disc,
3) PH by PH meter.

Chemical parameters:- Chemical parameters will be analysed by using standered methods such as given in APHA (1989)

i Dissolved oxygen by Winklers method.

ii Free carbon dioxide by titration method.

iii Total alkalinity by titration method.

iv Chlorinity by titration method.

v Chemical oxygen demand by titration method.

vi Biological oxygen demand by BOD incubator.

vii Hardness by titration method.

viii Silicates, Phosphorous, Nitrogen, sulphates, iron etc will be estimated by using colorimeter and spectrophotometer.

Biological parameters:-

For biological study random water samples will be collected with the help of silk plankton net, then by using 4% formalin and Lugols solution the zooplankton and phytoplankton will be preserved respectively for their identification and classification also. For the study of phytoplankton and zooplankton water sample will be observed under research binocular microscope.

Plankton will be identified, classified with the help of standered key and reputed literature. The quantitative estimation of zooplankton will be carried out with the help of Sedgwick Rafter cell method. Estimated Planktons will be preserved by using 4% formalin and Lugols solution the zooplankton and phytoplankton respectively. Photomicrography. Statistical analysis. Project writing.

6. Importance of study:

The primary goal of this research is to optimize the benefits of water utilization for irrigation through the Zari Dam while also meeting the problem's constraints. There is also a great need for research on Zari Dam in terms of physicochemical parameters as well as biological parameters such as planktons and fishes. This research examines the relationship between working closely with sewerage and water purification, as well as dam and water catchment management, etc. It also investigates the impact of human activities on biological populations, as well as the restoration of damaged ecosystems. It lays out principles for water management and pollution prevention. There is an urgent need for time in terms of maintenance, management, and for its effective and efficient conservation. The research would aid in the identification of Zari Dam's Hydrobiological diversity and productivity. The Research also aims to learn more about Zari Dam's physicochemical parameters of water fisheries management methods, as well as its fish production and use patterns.

6. Proposed work plan:

Year wise plan of work and targets to be achieved

1. **First year:** A review of the literature will be done by reference to related work. Study of area and collection of samples for analysis of physicochemical parameters and biological parameters of water.

2. **Second year:** Analysis of water samples as per schedule time. Collection and identification of planktons and fishes and identified using standard taxonomic literature. Publication of research paper.

3. **Third year:** Completion of data and preparation of final report and Submission of PhD thesis for the award of Doctor of Philosophy.

Chapter Scheme:

The work will complete in following chapters,

Chapter 1: Introduction

Chapter 2: Information about study area

Chapter 3: Literature reviews

Chapter 4: Data collection and analysis

Chapter 5: Result and Discussion

Chapter 6: Recommendation

Chapter 7: Bibliography

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